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ECA to hold hearings on Peace-Athabasca delta

The Honourable W. J. Yurko, Minister of the Environment, has announced that he has requested the Environment Conservation Authority to hold public hearings regarding the Peace-Athabasca Delta.

Specifically, the hearings will publicly examine the recommendation by the Peace-Athabasca Delta Project Group that submerged weir control structure be constructed at the Little Rapids site at the Riviere Des Rochers to restore lake levels on Lake Athabasca, and consequently on the delta, to approximately what would have occurred under historical conditions.

The Peace Athabasca Delta Project Group was a task force established by Alberta, Saskatchewan and the federal government to examine low water levels in Lake Athabasca and their effects on the delta.

The recommendation was included in their summary report published last year.

Mr. Yurko said he expects the hearings to be held in late September in both Edmonton and Fort Chipewyan.

Exact dates will be announced later by Dr. Walter Trost, Chairman of the Environment Conservation Authority.

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JUNE 1973 VOLUME 3 NUMBER 2

Honourable W. J. Yurko
Minister

Dr. E.E. Ballantyne
Deputy Minister

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AMA, Environment combine for car exhaust testing

In recent years, Albertans have heard a lot about pollution.

"Count Down to Clean Air" is a program of vehicle emission testing and research which will be carried out by the Alberta Motor Association and Alberta Environment during 1973.

Using two mobile exhaust emission analyzers mounted in trucks and camper units, the Alberta Motor Association and the Government of Alberta will test vehicles in every major centre of the province. These testing units will establish themselves in readily accessible areas, and motorists will be invited to have their vehicles tested, a procedure which takes only a matter of a few minutes. They will be advised of the emission rate, and will be supplied with information materials relating to vehicle emissions and their impact on the environment.

The Alberta Motor Association's Data Processing Department will then feed the results through our computer, and supply the data to Alberta Environment for further analysis and study.

The objectives of the "Count Down to Clean Air" program are simply:

1. To identify the automobile in the public mind as a major contributor to air pollution.

2. To educate and inform the public of measures which are being taken by the government and industry to prevent air pollution.

3. To provide a means of measurement for the public for comparison of their vehicles to acceptable rates of exhaust emissions.

4. To encourage individuals to maintain their vehicles in an effort to protect our clean air.

5. To determine the amount of emissions expelled by the average automobile in Alberta.

6. To publicly demonstrate the concern of both the government and the Association with respect to air pollution.

Facts about pollution from automobile exhaust

Spark retard reduces HC, CO, and NOx emissions and increases fuel consumption. The NOx emission reduction is due to the lowering of peak combustion temperatures and pressures.

Restricted positive crankcase ventilation valve flow, increases HC and CO emissions and fuel comsumption, while reducing NOx emissions at low speeds. The loss in NOx emissions is probably due to the lower combustion temperatures in the rich mixture.

Increases in idle fuel-air ratio cause increased HC and CO exhaust emission and excessive fuel consumption at low speeds. Decreased nitric oxide emissions normally accompany rich mixture adjustment.

Changes in CO emission generally tend to govern changes in total pollutant emissions, due to the overwhelming amount of CO in the exhaust.

Clean air standards established by the United States Government require manufacurers to remove 98% of a vehicles hydrocarbons and 97% of its carbon monoxide emissions by 1975. This is a 90% reduction over 1970 Federal standards.

Oxides of nitrogen must be cut by 90% in 1976 models and cars must meet these standards for five years of 50,000 miles.

Oxides of nitrogen present the most difficult control problem. More efficient combustion needed to reduce hydrocarbons and carbon monoxide tends to generate more NOx.

The ultimate solution is to produce perfect combustion with ignition of a balanced volume of fuel and air at the lowest possible temperatures.

Manufacturers today appear to be concentrating on a thermal reactor and catalytic convertor to meet government standards.

The thermal reactor is a "beefed-up" exhaust manifold that burns up pollutants with extremely high temperatures.

The catalytic convertor will use heat and various chemical substances to transform the three major pollutants into harmless carbon dioxide, nitrogen, and oxygen.

Engine Alternatives

ROTARY ENGINES:

The Wankel engine using a triangular piston inside an oval chamber is one of the most promising new concepts in engine design. Although still an internal combustion engine, the Wankel by virtue of 400 sub-patents now meets most pollution standards. Originally invented in Germany twenty years ago, the engine generates much more power per pound than the conventional engine, has about one-third the total parts, and operates quietly and without vibration. It tends to emit more hydrocarbons, but because of its design, pollution equipment is easily adapted.

TURBINE ENGINES:

The Turbine's continuous flame generates very little pollution but for the most part offers poor fuel economy, a high noise level, and is extremely costly to produce. Chrysler launched a fleet of fifty turbine test cars in 1964 and is still testing this power source.

STEAM ENGINES:

The Rankine Cycle engine is a far cry from the original steam engines of years ago. Experimental vehicles today operate on closed-cycle engines in which liquid is vaporized in coils by a continuous flame. The vapor then operates a piston or turbine, and is cooled back to liquid form in a condensor. Although warm-up time has been reduced to a few seconds, technical problems still surround the matter of engine size and weight as well as a high efficiency condensor.

ELECTRIC ENGINES:

Offering pollution free propulsion, electric concepts still require technological improvements not so much in the engines as in the batteries or power source. As a result, range and speed are for the present at least, somewhat hampered. One current test unit can accelerate to 40 M.P.H. in ten seconds and can cruise for 125 miles at 60 M.P.H. Batteries can be recharged to 80% in thirty minutes.

HYBRID ENGINES:

Several experiments are underway with combination power units. For example, small gasoline engines to provide constant power for recharging batteries which run electric motors that in turn power the car. Another approach utilizes a fly-wheel spinning at a high rate of speed to propel the vehicle while the wheel (called kenetic energy wheel) is powered by either a gasoline or electric motor.

MODIFIED INTERNAL COMBUSTION ENGINES:

Standard automobile engines can be converted to run on any of three forms of hydrocarbon gas - compressed natural gas - liquified natural gas - or liquified petroleum gas (propane). Of the three, propane is most practical since it is readily available. Conversion cost is several hundred dollars, however engine life is generally extended and mileage cost is less. In many cases, a combination of gasoline and propane can be utilized.

LETTERS

Re: Snow dumps don't cause problems in cities, environment report concludes April/May 1973 issue of Environment News

I think your headline has mislead your readers; and the "gradualism" evident in the quotations from the report has "taken-in" your author. The quotes do not warrant the satisfaction evident in your comments.

The third paragraph quoted which starts, "Analytical results..." implies that snow disposal operations do contribute pollution. It implies that compared with other expectations it has "little significant effect". As I read the generous viewpoint taken in your headline and the subtle weaning away of our concern by the phrasing in the third paragraph, I imagine a litre of water with the fifth of a gram of grease floating on the top mentioned in the 4th para from the bottom. I have seen less than that floating in my coffee cup.

The last paragraph once more draws the reader into acceptance of the practice by the use of the phrase, "inconsequential in comparison with..." I guess the true comparison ought to be with no pollution.

I cannot dispute the effect of the pollution resulting from the snow dump; perhaps it has no effect on living things. The question that arises in my mind though, goes like this: did the authors of the report find a practice which does indeed contribute pollution to our rivers, but for reasons of their own, report it in such a way that the reader would do exactly as you have done and conclude that it causes no problems.

Ralph Himsl
Superintendent of Schools
Lethbridge Catholic Separate School
District No. 9

ENVIRONMENT NEWS

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Plants: How They Benefit Man
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July
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- *Canada Department of Agriculture Advertisement*

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	$ Million PEP Program
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	Man and Resources: A Challenge to Governments
	ECA to Study Foothills Land Use and Development
	Peace-Athabasca Task Force Recommends $1 Million Dam

Dryland seepage: a problem for southern farmers

Dryland seepage or soil salinity (commonly referred to as alkali) is a form of pollution that is becoming of increasing concern to the rural people in many parts of southern Alberta and one that should and may become of increasing concern to the urban resident as well.

Briefly, a saline soil is one in which the productivity has been harmed by an accumulation of soluble salts resulting from a high water table or the discharge of groundwater at the soil surface. In a few instances, the groundwater discharge or seepage may not result in a salt buildup. Dryland salinity is used to refer to salinity that occurs outside of the irrigated areas.

The soluble salts are formed by the normal weathering of the mineral constituents of the soil, but rarely become a problem in the location in which they are formed, as they are normally leached out of the surface soils by precipitation.

It is only when they are dissolved by water moving beyond the root zone of plants and carried laterally by this groundwater to surface at a lower position on the slope that they become a problem. In arid and semi-arid areas such as southern Alberta, evaporation and consumptive use of this water by plants results in a concentration of salts which interferes with crop growth and the lands may eventually become barren.

Although there has undoubtedly always been some saline soils in southern Alberta since before the beginning of settlement, there has been an increased development and expansion of them since cultivation began.

In recent years, there has been a noticeable increase in their rate of development which prompted delegates at an Agricultural Service Board Conference held in Lethbridge in the spring of 1969 to consider it the most serious problem facing farmers in southern Alberta at that time.

This problem has also become of increasing concern in recent years in parts of the other prairie provinces and the states of Montana, North Dakota and South Dakota.

In addition to lowering the productivity of the land and increasing the cost of operating farm lands, with the resultant loss of income to the farmers, it results in increased costs of road and highway construction and maintenance, lowers the municipal tax base, affects building sites and structures and necessitates the construction of drains in places to control it.

It is also known to be affecting some urban areas where it results in damage to trees, shrubs, gardens and lawns, deterioration of foundations and structures, and increased cost of installation and maintenance of streets, sewers, water lines and other services.

In some areas, the salts being carried by the groundwater are leading to a deterioration in water quality in wells, dugouts, rivers and streams.

In contrast to salinity and seepage in irrigation projects (which are known to have resulted in the decline of ancient civilizations) where the major sources of the excess water causing the problem are known and their solution more readily applied, the source or sources of the excess water causing the accelerated rate of increase in the dryland areas are not as readily apparent and have not as yet been clearly defined. Recent studies in Montana have indicated that summerfallowing may be the major contributor to the problem.

Only a portion of the water falling on the summerfallow is stored in the soil. The excess water falling on the upper slopes, referred to as the recharge area, moves downward to the water table above an impermeable layer, and moves laterally down the slope to reappear in the discharge area. As it does, it picks up salts from the soil.

However, not to be overlooked are the other possible sources such as the upward movement from underlying bedrock aquifers containing water under artesian pressure in those areas where these occur.

Water could be moving upward from these aquifers through natural faults, seismic drill holes and improperly installed or corroded well casings in present or abandoned wells.

Seepage from dugouts, dams, reservoirs and sewage lagoons, as well as increased infiltration resulting from other ponding areas caused by the works of man are undoubtedly also contributing to problems in some areas.

Alberta Environment's Earth Sciences and Licensing Division is involved in this problem for a number of reasons: as the activities and works of man are undoubtedly the major contributor to the problem, it can rightly be considered a form of pollution; the involvement of groundwater, which comes under the jurisdiction of the department; previous experience and involvement in the problem by members of the departmental staff, so they can provide this expertise in assisting and co-operating with other agencies, departments and governments that are involved; general concern for the well-being of the residents of the province.

For a number of years the former Soils, Geology and Groundwater Branch of the Water Resources Division, which now forms a portion of the Earth Sciences and Licensing Division of the Department of the Environment has serviced requests by individual farmers, groups of farmers or municipal bodies for advice or assistance in solving or alleviating this problem and reclaiming the land.

In the past this has normally resulted in investigating the feasibility of drainage, design of drains and recommendations with regard to their placement where considered feasible. Unfortunately, the costs of drainage in relation to the acreage that can be reclaimed has resulted in only a few of these drains being constructed.

Prompted by the growing concern of local people as expressed at the Agricultural Service Board Conference and by individuals, it was decided in 1972 that an inventory of the extent, severity, distribution and rate of increase of the problem in the southern part of the province should be undertaken.

A start on this was made possible in the spring of 1972 by the Student Temporary Employment Program under which funds were made available to hire a university student to carry out an aerial photograph interpretation of the problem.

Photographs taken in 1970 under the Federal L.I.F.T. program were used to obtain the current pictures with 1961 or 1962 photographs used in some areas for comparative purposes to obtain information on the rate of increase. Information was also obtained from county and municipal assessment records.

This work was continued during the winter in co-operation with the Alberta Department of Agriculture who provided funds through the Priority Employment Program. It is currently being carried on under the 1973 S.T.E.P. program.

Preliminary results indicate that in many areas up to 10 per cent of the arable land is affected by salinity with as much as 16 per cent occurring in some severely affected areas. In one 36-section block in the County of Lethbridge assessment records show a 10-fold increase in the area affected over the period from 1960 to 1970.

In January, 1973 a workshop on the subject was held in Lethbridge attended by representatives of farmers and government agencies with responsibilities in this area to review the present state of knowledge on the subject and to investigate and promote practical measures to control the rate of growth of the affected areas.

This workshop has been organized by an interdepartmental and intergovernmental committee consisting of representatives of the Departments of the Environment and Agriculture, and the Canada Department of Agriculture Research Station at Lethbridge. It attracted participants from Manitoba, Saskatchewan and Montana as well as from Alberta.

It was the consensus of the workshop participants that there is still much to be learned about the problem and practical means of controlling it. It proposed that a continuing committee be set up consisting of representatives of the agencies responsible for the organization of the workshop plus a farmer representative from the Agricultural Service Board of the County of Warner.

One of the activities of this committee to date has been to circulate a questionnaire to farmers in the Counties of Warner, Lethbridge, Vulcan and the Municipal District of Willow Creek. Although the questionnaires are still being received, the response so far has been gratifying and again points out the concern over this problem.

This committee has also been instrumental in locating three areas for pilot projects in the southern part of the province where the farmers are prepared to co-operate in trying out certain of the control methods suggested at the workshop. These are in various stages of organization at the present time.

One research site has been selected approximately two miles south of Champion, Alberta, where a seepage discharge area and its locally surrounding recharge area is being studied.

Cropping techniques in the surrounding recharge areas are being altered in an attempt to intercept and utilize water movement along a perched watertable.

Summerfallow rotation is being abandoned in favour of continuous cropping, and high consumptive use crops such as alfalfa is also being utilized in the recharge areas.

Water table levels are being monitored to determine the effect of these cropping techniques. Artesian water pressure from possible underlying bedrock formations is also being investigated.

The second site is located approximately 2 1/2 miles northeast of Claresholm. So far this site involves only one owner and one quarter section of land; however, it may be expanded as the investigations proceed. It similarly involves an alteration in the cropping pattern to get a greater consumptive use of the excess moisture by plants.

The third site is located near Milk River but at the present time is only in the preliminary planning stages and will not get underway until next year.

In addition to these projects the Department of the Environment is also investigating the part that seismic activity may have had to problems in a portion of the County of Vulcan underlain by an artesian aquifer.

Public meetings to discuss recreation trails in Alberta.

A series of public meetings to discuss recreation trails in Alberta will be held next October in Edmonton, Calgary, Lethbridge and Grande Prairie.

The two-day seminars are being organized and sponsored by the Alberta Government Recreation Committee. Alberta citizens who have a great deal of interest in outdoor activities and environmental matters are encouraged to attend the seminars or send written submissions to the Committee.

While a number of recreation trails already exist in Alberta for such purposes as hiking, bird watching, riding, bicycling, canoeing and snowmobiling, it is recognized that much can be done to provide greater enjoyment for citizens of the province.

The seminars will serve to bring together those interested in trails and trail development, both current and potential trail users, to consider the following:

1. What trails exist and what are being developed
2. The problems of trail use such as damage to property and the environment
3. The development of trail use education and communication programs
4. The need for an association to co-ordinate planning and development of a provincial-wide trails system
5. The need for legislation on trails and their use.

The Alberta Government Recreation Committee enables government departments and agencies to co-operate in the planning of their recreation services and programs. The committee chairman is the Hon. Horst A. Schmid, Alberta Minister of Culture, Youth and Recreation.

Requests for information and written submissions should be directed to: The Executive Secretary, Alberta Government Recreation Committee, 14th Floor, CN Tower, Edmonton, Alberta, T5J 0K5.

From waste to raw material

An ideal solution for industry is to have one company use the effluent from another company as its raw material. This is exactly what is happening in Kamloops, B.C. with Gulf Oil Canada Ltd.

Like most refineries with catalytic cracking units, the Kamloops plant uses caustic soda or sodium hydroxide to "scrub" hydrogen sulphide and mercaptan sulphur from gasoline streams. Disposal of the strongly alkaline "spent caustic" presents a problem for refineries - many of which spend up to 10 cents a gallon for neutralization and/or trucking to disposal sites.

The volume of spent caustic is not large, about 160 gallons a day, but it is still enough to cause a pollution problem. Last spring Gulf engineers asked whether the expanding Weyerhaeuser Canada Ltd. pulpmill on the other side of the river might be able to use some of the refinery waste in their kraft pulp process.

Weyerhaeuser, already spending $22 million of its $100 million expansion cost on anti-pollution measures, analyzed the material from Gulf and found it to be entirely satisfactory for use.

Since that time the Gulf refinery has been supplying about three per cent of the pulpmill's total needs. The refinery trucks the material to the pulpmill every three weeks at a cost of about one cent per gallon.

An additional benefit is that Gulf is able to obtain its fresh caustic needs at a better price from a large-scale buyer such as the pulpmill; and the mill takes back the waste caustic from Gulf on a pound-for-pound sodium ion content basis. Both sides are pleased with the results of the recycling. If more industries would only look around, they might see there are places where their excess effluent might be of some use to someone.

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